



## CAA Compliance Inspection Report

### *Partial Compliance Evaluation – Test Observation Report* *M&D Digester Inlet Testing*

**Clearwater Paper Corporation**  
Lewiston, Idaho

**Inspection Dates: April 8-12, 2014**

Zachary T. Hedgpeth  
Report Author Signature

8-5-15  
Date

Zach Hedgpeth, PE  
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EPA Region 10

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## **Attachments**

Attachment 1 .....	EPA Region 10 Photolog
Attachment 2 .....	Facility Location Maps
Attachment 3 .....	Clearwater ICR 2014 Test Plan_v3
Attachment 4 .....	Clearwater Paper Sawdust Digester Feasibility Report 4980 final
Attachment 5 .....	Clearwater PCE Report - FINAL 20140225

## **1. Basic Facility and Inspection Information**

Facility:	Clearwater Paper Corporation Lewiston, ID
Mailing Address:	803 Mill Road / P.O. Box 1126, Lewiston, ID 83501
AFS Number:	1606900001
FRS Number:	110009335905
SIC:	2611 – Pulp Mills 2621 – Paper Mills
NAICS:	322110 – Pulp Mills 322130 – Paperboard Mills
Permit Number:	Title V Air Operating Permit – Idaho DEQ Tier I Permit No. T1-2010.0030 – Pulp & Paper Division No. T1-2010.0029 – Consumer Products Division
Facility Contact:	Rick Wilkinson, Environmental Engineer, 208-799-1684
Agency Inspectors:	Zach Hedgpeth, EPA Region 10
Dates of Inspection:	April 8-12, 2014
Date of Report:	August 5, 2015

### **Disclaimer**

This report is a summary of observations and information gathered from the facility at the time of the inspection. The information provided does not constitute a final decision on compliance with CAA regulations or applicable permits, nor is it meant to be a comprehensive summary of all activities and processes conducted at the facility.

## **2. Introduction**

Clearwater Paper Corporation (Clearwater) is located just east of Lewiston, Idaho along the south bank of the Clearwater River. Maps showing the location of the facility are included as Attachment 2. The facility is a kraft pulp and paper mill and is a major source of air pollutants.

This partial compliance evaluation (PCE) Clean Air Act (CAA) inspection consisted of observation of testing activities on the inlet lines feeding into the bottom of the Kone bins on the two Messing & Durkee (M&D) sawdust digesters. A test protocol prepared by Horizon Engineering (Horizon) is included as Attachment 3. The testing was conducted following a pre-test feasibility evaluation performed by Horizon in December 2013. Horizon's report documenting the results of the pre-test feasibility work is included as Attachment 4. My report documenting the pre-test feasibility work is included as Attachment 5.

As requested by the Region 10 Air & RCRA Compliance Unit, I was onsite at the Clearwater Paper facility throughout the testing fieldwork conducted by Horizon which occurred April 8-12, 2014.

## **3. Process Description**

See Section 3 of Attachment 5.

## **4. Pre-Fieldwork Discussions**

I held two pre-fieldwork coordination calls at about 15:15 and 16:00 on 4/7/14 with Rick Wilkinson and the Horizon testing personnel. The calls confirmed that Horizon planned to start setup and logistics work this evening, and that nothing had changed in the testing plans from the test protocol. Start time for the following morning was set at 7:00. Based on this information, I determined not to come onsite at the facility until the following morning.

## **5. Inspection Activities – Tuesday, April 8, 2014 – 07:20 to 18:15**

### **5.1. Arrival and Opening Conference**

- Arrival Time: 7:20 at security gate.
- Presented credentials to: security guards at gate.
- Opening conference, approximately 7:45 to 8:00.
  - Attendees: Rick Wilkinson, Bob Pernsteiner, Clayton Steele, Zach Hedgpeth
  - Scope of inspection communicated as test observation only.
  - Agreed to share photos as done during pre-test feasibility project.
  - Some discussion occurred regarding the possibility of controlling M&D gasses by routing to the low volume, high concentration (LVHC) gas collection system and thus to the incinerator. Gas conditioning to remove liquids and solids was mentioned as one challenge. Initial cost estimates are around \$400-500k.

## **5.2. Test Observation Notes – 4/8/14**

1. 08:15 – M&D control room. I spoke briefly with operators and took photos of control system screens (“PI” system). Operators informed us that one of the paper machines has to go down for 1-2 hours, reducing demand for pulp. M&D operators plan to reduce production on M&D #2 and maintain full production on M&D #1 for as long as possible in consideration of the testing.
2. 08:30 – M&D testing location. Testing is underway on M&D #1 with Method 308 (methanol), Run 1 at sampling point 1A. I spoke with Joe Heffernan of Horizon and learned that the run had been paused after 15 minutes because the temperature at the dry gas meter had exceeded 70°F. Horizon had added ice and wet rags to the impinger box and would restart the run once the gas temperature was reduced. Mr. Heffernan indicated that the sampling approach using nitrogen dilution appeared to be working.
3. 09:15 – M&D control room. I met with Dave Terzel, Clearwater process engineer, to discuss production measurement on the digesters. Mr. Terzel explained that pulp production numbers are not directly measured, but instead are derived from blow tank volume and percent solids estimates. The blow tank volume is directly measured, while percent solids is estimated based on several factors along with informed assumptions. Overall production is pro-rated between the two digesters proportional to the screw rotation rate.
4. 09:40 – M&D testing location. I spoke with Mr. Heffernan and learned that run 1 went fine to all appearances. Mr. Heffernan explained that the plan is to complete three methanol and three total reduced sulfur (TRS) runs per day. This would result in completion of testing on one sampling point each day, with today being point 1A.
5. 10:17 – M&D testing location. I learned that an earlier minor problem with plugging of the pitot had been resolved by purging the probe with nitrogen gas.
6. 13:25 – M&D testing location. Run 4 (TRS run 1) was aborted/paused because the vacuum reading on the summa canister was observed to be dropping too quickly. It was discovered that the canister had been connected to the sample line without a flow controller. Run 4 was then restarted using a new canister equipped with a flow controller.
7. 18:15 – M&D testing location. Run 4 (following restart) along with runs 5 & 6 were completed without significant incident. Note regarding the run naming scheme: runs 1-3 on each sampling point will be Method 308 (methanol) runs, while runs 4-6 will be TRS runs. Volumetric flow rate and temperature data is collected for all runs, so flow rate and temperature datasheets show runs 1-6 at each sampling point. I departed the facility at about 18:15.

## **6. Inspection Activities – Wednesday, April 9, 2014 – 07:40 to 17:15**

I arrived at the facility at about 07:40 and met Mr. Wilkinson at the entrance gate. We proceeded to the environmental offices where we were joined by Bob Pernsteiner. Mr. Wilkinson and Mr. Pernsteiner stated they had some concerns regarding the dilution testing approach that they would like to discuss. The specific concerns identified at this time were related to the possibility of pressure fluctuation or pulsing in the process lines, whether this

pulsing causes the pressure in the lines to go negative, and whether any potential exists for backflow of the nitrogen dilution gas into the process lines instead of into the sample lines. The question was raised also regarding the temperature being around 210°-212°F, and whether there were any additional issues related to this temperature that haven't been discussed. It was agreed that the group would hold a discussion regarding these items later in the day when it was possible to include Mr. Heffernan in the discussions.

Following this initial discussion, I proceeded to the M&D control room, and then to the M&D digester testing site.

### **6.1. Test Observation Notes – Morning 4/9/14**

1. 09:30 – M&D testing location. Along with Mr. Pernsteiner and Mr. Wilkinson, we described the concerns identified above to Mr. Heffernan and planned to discuss the issues during run 3 this morning.
2. 11:00 – M&D testing location. During run 2, Method 308, on sampling point 2A we received word that digester production had dropped significantly for 11 minutes due to malfunctions related to the pulp washers. A discussion was held between Mr. Wilkinson, Mr. Heffernan, and myself regarding the question of whether this production decrease should invalidate the run. My input was that the run should still be considered valid, and that the decreased production rate would be reflected in the emission rate resulting from the test run since the units of interest are pounds of methanol per ton of pulp produced. I stated to Mr. Wilkinson that the test report would need to include 1-minute production data so that this drop in production rate is evident.

### **6.2. Meeting at Environmental Offices**

Beginning at about 11:30, a meeting was held at the facility environmental offices to discuss the concerns raised by Mr. Wilkinson and Mr. Pernsteiner earlier in the day (described in Section 6 above). The following personnel attended this meeting: Rick Wilkinson, Bob Pernsteiner, Clayton Steele, Zach Hedgpeth, and Joe Heffernan.

After general discussion of the concerns described under section 6 above, Mr. Heffernan offered the following information:

- The data being collected provide two independent methods which we can use to calculate the ratio by which the sample gas is being diluted by nitrogen (the dilution ratio).
- The first method uses direct gas flow rate and volume data. The flow rate, or (volume over a specified time) of the nitrogen gas being introduced into the sample collection line is being measured by the mass flow controller, while the total sample gas volume is being measured by the dry gas meter. The nitrogen dilution ratio can be calculated using these two data elements.
- The second method uses moisture content data. The intent of the nitrogen gas dilution approach is to reduce the moisture content in the sample gas so that it is lower than the moisture content of the gas in the duct to facilitate the testing and

sample collection process. Psychrometry using wet bulb and dry bulb temperature measurements are used to directly measure the moisture content within the duct. The moisture content in the diluted sample gas is determined using EPA Method 4 based on the volume of liquid collected in the sample train impingers. The nitrogen dilution ratio can be calculated using the moisture content of the gas in the duct along with the moisture content of the diluted sample gas.

- If these two independent calculations produce similar dilution ratios then nitrogen gas has not been lost back into the duct.

Following this explanation by Mr. Heffernan, Mr. Steele expressed the opinion that the moisture content suggests that most of the methanol is in the steam. The meeting concluded at about noon.

### **6.3. Test Observation Notes – Afternoon 4/9/14**

After a lunch break, I returned to the M&D testing location at about 13:00. The only notable occurrence during this afternoon's testing was that at 16:20 Mr. Heffernan informed me that during run 5 (TRS run 2) on sampling point 2A, it was noted that about 80 milliliters (ml) more liquid was collected in the impingers than had been observed on previous runs. Also, the Summa canister final vacuum was only about 0.75 pounds per square inch (psi), where it had been about 2.5 psi on the previous runs. Other than these items, the three TRS runs on M&D #1, point 2A went smoothly.

I departed the facility at about 17:15.

## **7. Inspection Activities – Thursday, April 10, 2014 – 07:40 to 16:15**

I arrived at the facility at about 07:40 and met Mr. Wilkinson at the entrance gate. After checking in briefly at the M&D control room, we proceeded to the M&D testing location.

### **7.1. Test Observation Notes – 4/10/14**

1. 09:20 – M&D testing location. Mr. Heffernan informed me that moisture collected in the impingers during run 1, Method 308, M&D #2, sampling point 1B was about 50% more than had been collected from the sampling conducted on M&D #1 over the past two days. Following run 1, testing work stopped while this issue was explored. The only factor that could be identified as different from the M&D #1 sampling was the configuration of the sample extraction line. Two specific differences were noted:
  - a. First, run 1 on M&D #2 this morning used only a single pipe “T” to introduce the nitrogen dilution gas (see photo 82), while the sampling on M&D #1 over the past two days had used two “T”s to introduce the dilution gas (see photo 53, point 2A as an example).
  - b. Second, during run 1 on M&D #2 this morning, the sample collection line was connected to the bottom of the “T” rather than the top as had been the case during M&D #1 sampling.



It was determined to reconfigure the sampling line to match the configuration used during previous sampling. The reconfigured sampling piping for sampling point 1B is shown in photo 90.

2. 11:20 – M&D testing location. The modification described above did appear to reduce the moisture content collected in the impingers. During run 1, 1,626 ml of liquid was collected, while only 1,296 ml were collected during run 2 (after the hardware was reconfigured). This was still more moisture than had been collected during sampling on M&D #1, where the impinger volume ranged from approximately 800-1,000 ml. Wet bulb/dry bulb temperatures measured on point 1B are also higher than as measured on points 1A and 2A. Mr. Heffernan indicated that he planned to check whether the increased moisture as indicated by the impinger liquid catch is proportional to the increased moisture as indicated by the wet bulb/dry bulb temperatures.
3. 11:40-12:15 – Conference call onsite. At this time, a conference call was held to discuss the moisture content results with Stef Johnson (Mr. Johnson) at OAQPS. Also participating in the call were Mr. Wilkinson, Mr. Heffernan, and myself. The following items were discussed:
  - a. Increased condensate volume collected in the impingers on point 1B compared to points 1A and 2A. Mr. Johnson agreed this would not necessarily invalidate the run.
  - b. Method 4 numbers appear to be biased high due to moisture droplets being collected. It is possible that the impingers contain liquid collected as droplets which also contain methanol. Since Method 308 measures the methanol in the liquid collected in the impingers, any liquid droplets collected that contain methanol will be combined with condensate (steam) and the methanol contained in the steam. Mr. Johnson mentioned a calculation that could be used to estimate the proportion of methanol in the air/steam versus in the liquid.
  - c. During recovery of condensate from run 2, Method 308, point 1B, some of the condensate collected in the third impinger was inadvertently spilled after the total weight had been recorded. Mr. Johnson agreed this was not cause to invalidate the run, but that the incident should be noted and described in the test report. The reasoning was that since only an aliquot of the combined condensate is sent to the lab for analysis, the loss of a small portion from the third impinger is not likely to impact the concentration in the aliquot.
4. 12:30 – M&D testing location. Data collected from point 1B include wet bulb/dry bulb temperatures indicating a moisture content of 101-103%, while EPA Method 4 moisture numbers indicate about 97%. With a dilution ratio of 50% nitrogen gas, Method 4 moisture content should be about half the value indicated by psychrometry (wet bulb/dry bulb) if the extracted sample consists only of dry gas and steam. In this case, it appears that collection of liquid droplets in the sampling line are resulting in Method 4 moisture content that is biased high.
5. 16:00 – M&D testing location. TRS runs on point 1B completed without incident. Depart facility at about 16:15.

## **8. Inspection Activities – Friday, April 11, 2014 – 07:30 to 10:40**

I arrived at the facility at about 07:30 and met Mr. Pernsteiner at the entrance gate. After checking in briefly at the facility environmental office, we proceeded to the M&D testing location.

### **8.1. Test Observation Notes – 4/11/14**

1. 08:00 – M&D testing location. Testing on M&D #2, point 2B, run 1, Method 308 had just begun. Mr. Pernsteiner informed me that Mr. Terzel would be staying with me while Mr. Pernsteiner and Mr. Wilkinson attend a meeting.
2. 08:50 – M&D testing location. Just after the completion of run 1, Method 308 on point 2B, I received a phone call from Mr. Wilkinson passing on direction that the testers must immediately stop work and evacuate the M&D building. I learned later that the M&D digesters were shutting down due to a broken screen on a downstream pulp washer. At this time, it is expected that the facility will be shut down for at least 8 hours.
3. 10:00 – Facility environmental office. I called Roylene Cunningham (Region 10 Office of Compliance & Enforcement) to discuss the plant shutdown and whether to require completion of testing. We agreed the best option would be to require the testing to be completed once the M&D digesters are back up and running.
4. 10:20 – Facility environmental offices. A meeting was held to discuss how to proceed with the testing project given the plant shutdown. All four Horizon testing staff attended the meeting, along with Mr. Wilkinson, Mr. Pernsteiner, and Mr. Steele in addition to myself. I began the meeting by communicating the decision by EPA to require the completion of the testing once the plant returns to operation. Some discussion occurred regarding possible scenarios for how the testing might be completed. Horizon staff and I both decided to depart the facility until we received word from Mr. Wilkinson that the M&D digesters are back in production. I departed the facility at about 10:40.
5. 11:00 – Hotel. I called Ms. Cunningham to discuss the project. In addition to general discussions regarding the project, during the call I described a conversation between myself and Mr. Pernsteiner that had occurred earlier in the day in which he had offered a potential explanation for why a larger volume of liquid was being collected in the impingers during testing on M&D #2 compared to M&D #1. The potential explanation discussed at this time between Mr. Pernsteiner and myself was that the Bauer valve on M&D #1 had been rebuilt more recently than the valve on M&D #2, the theory being that the clearances between the Bauer valve vanes and the walls of the valve would be tighter on M&D #1, thereby allowing a smaller quantity of gasses, steam, and liquids to escape upward into the metering screw and thus into the exhaust chamber and Kone bins. This theory was later refuted by Mr. Pernsteiner based on additional information as described in Section 9.1 of this report (see below).
6. 20:30 – Hotel. I received a call from Mr. Wilkinson informing me that the M&D digesters were not expected to reach full production until about 22:00. Based on this late hour, Horizon staff had determined to re-start testing the following morning.

## **9. Inspection Activities – Saturday, April 12, 2014 – 07:20 to 13:00**

I arrived at the facility at about 07:20 and met Mr. Wilkinson at the entrance gate. We proceeded to the facility environmental offices and met briefly with Mr. Steele at about 07:40. All agreed that a formal closing conference was not necessary following the completion of testing.

### **9.1. Test Observation Notes – 4/12/14**

1. 08:00 – M&D testing location. After a short visit to the M&D control room, we proceeded to the testing location. Testing on point 2B was underway.
2. M&D testing location. During testing on point 2B, Mr. Pernsteiner provided additional information regarding the potential explanation he had offered on the previous day regarding the increased volume of liquid collected in the sampling impingers from M&D #2 as compared to M&D #1. This explanation is described in Section 8.1, item 5 above. Mr. Pernsteiner explained that the potential explanation described had been a guess by one of the M&D operators, but was based on incorrect information and was therefore not accurate. The incorrect information on which the operator based his hypothesis was that the M&D #1 Bauer valve had been rebuilt more recently than the Bauer valve on M&D #2. In fact, Mr. Pernsteiner explained that both Bauer valves were rebuilt most recently in or around May 2013. Both Bauer valves require a rebuild about every 12 to 18 months.
3. 13:00 – M&D testing location. The remainder of the testing on point 2B was completed without incident, and I departed the site at about 13:00.